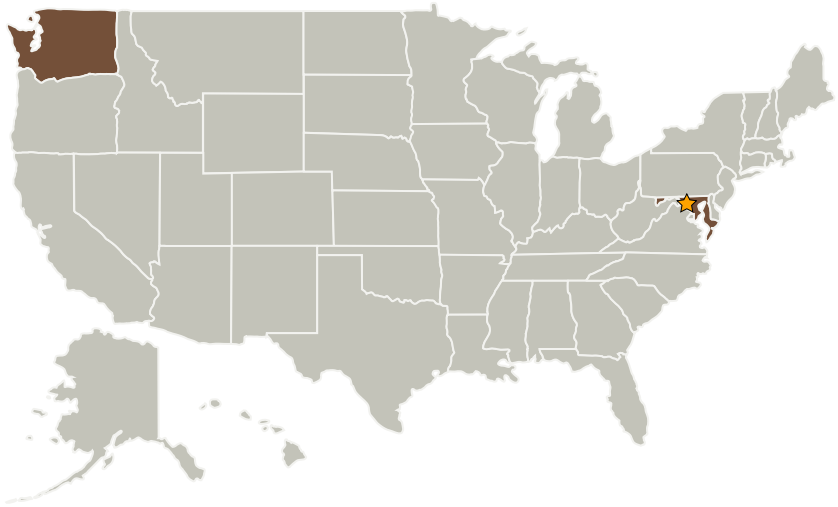
All-Fiber Components for Micro-Structured Fibers, Phase I

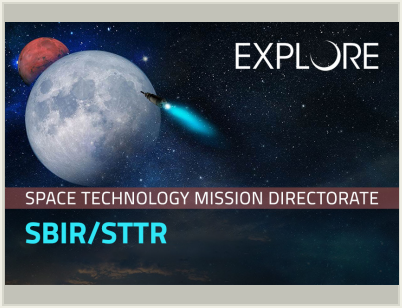
Completed Technology Project (2008 - 2008)

Project Introduction

We propose new concepts for developing components for high performance space based Lidar systems. While it is generally recognized that photonic crystal fiber technology can extend the performance range of fiber laser based sources these fibers are considered by many to be incompatible with complementary component technology such as fused couplers and pump combiners. Integration of these fibers into real systems for deployment either in space or terrestrial systems is hindered by the very structure which brings the advantage in effective area and nonlinearity mitigation. The problem is related to the air holes which provide guidance for both pump and signal. Our proposal centers not on developing sophisticated new component manufacturing techniques but rather on modifying the micro-structured gain fiber itself to retain the desirable advantages while eliminating the problems associated with component development. This can be achieved by use of only refractive index micro-structuring to create an all-solid structure with index control an order of magnitude better than direct deposition techniques. In the phase I program we will demonstrate an all solid micro-structured gain fiber with effective area >500μm2, as well as showing the feasibility of fabricating compatible tap couplers and pump combiners.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Aculight Corporation	Supporting Organization	Industry	Bothell, Washington

Primary U.S. Work Locations	
Maryland	Washington

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

John Minelly

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers